spokes

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Miruna Amza & Iris Opris
A wild and fertile ground

spokes, noun, plural of spoke
1. One of the rods or braces connecting the hub and rim of a wheel.
2. *Nautical* One of the handles projecting from the rim of a ship's steering wheel.

ecsite

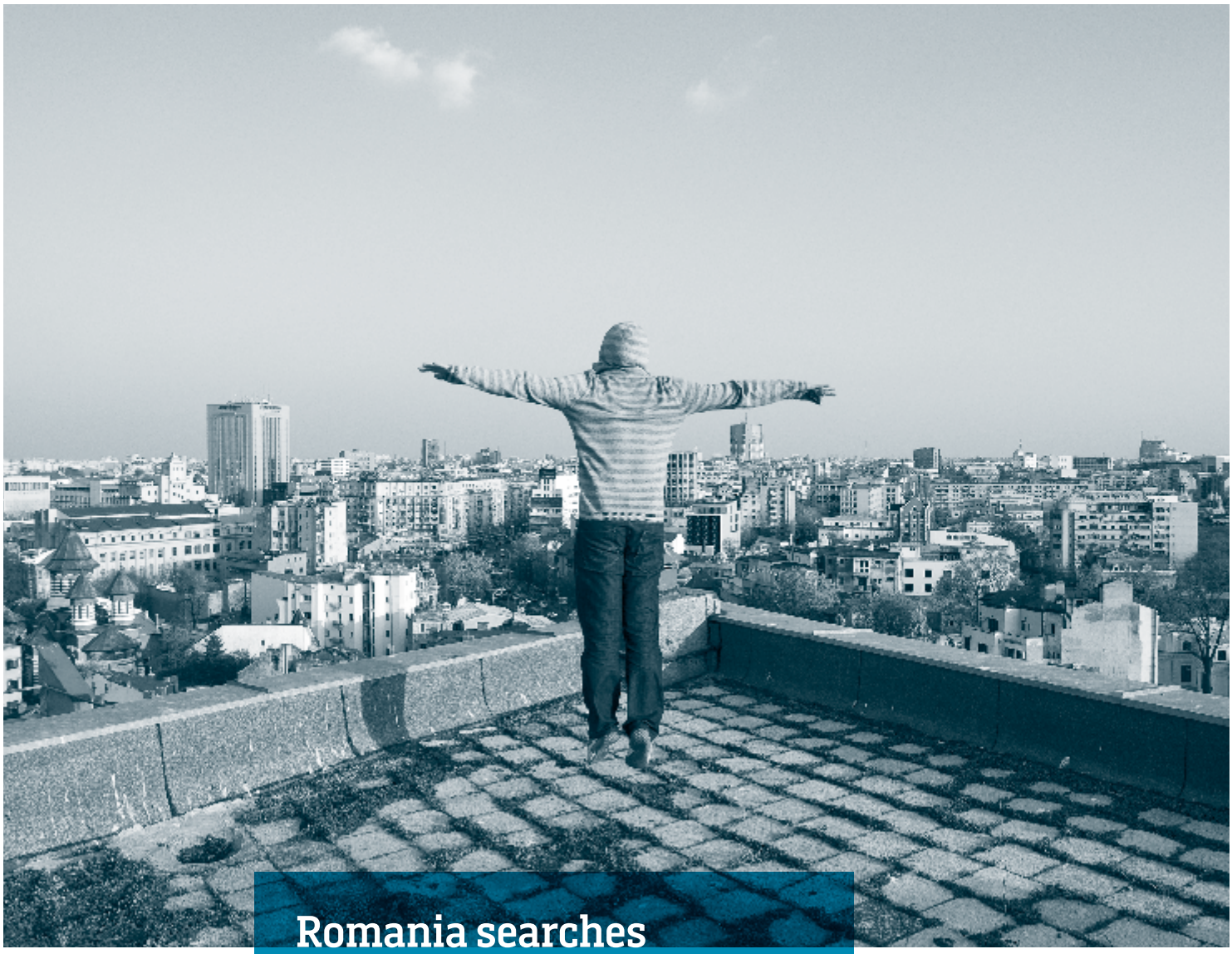

photo by Stefan Tuchila

Romania searches for footing in public science engagement

Overlooking Bucharest, Romania.

A wild and fertile ground

MIRUNA AMZA & IRIS OPRIS
ACTIVI PENTRU VIITOR AND THE STEAM INITIATIVE,
BUCHAREST, ROMANIA

Science in Romanian society is like the theatre: Scientists perform on stage while citizens take on the role of passive spectator to the changes unfolding before them. Living in politically and economically turbulent times, we may question ourselves if this is the right place or momentum to push things forward. Do we have what it takes? Can we make it through?

Poverty-driven innovation

Once upon a time, one of the things Romanians used to love and praise was their science education. In the days of the Communist regime the push to industrialization was strongly reinforced by the study of mathematics, physics, or chemistry. In return, graduates were promised respectable, secure jobs. Our students became world class and this was a subject of national pride. Industries and research gathered into clusters, sustaining various branches of the scientific effort. Certainly, everybody was focused on doing their jobs according to the directives of the Party, but this didn't preclude passion and dedication. There was more to it than nine to five jobs.

Some of these people would go home and continue to research, innovate or invent on their own. Were they so lucky as to not fall under the vigilant eyes of the Securitate – the secret police – their projects would do just fine. But the centralized planning of the industry according to the dictator's personal whims eventually crippled the economy and made Romania one of the poorest countries behind the Iron Curtain. The lack of resources and the widespread censorship paralyzed scientific research, but it spurred a wave of poverty-driven innovation; hence, the popular saying that Romanians can solve any problem with a piece of wire.

How do we halt the brain drain?

As the borders opened following the fall of Communism, Romanian perspectives suddenly changed, as their world became wider and full of possibilities. Emigration has been a recurring theme ever since, particularly for high school and college students.

Talented students still perform excellently in international competitions of astronomy, math, physics and informatics. World class universities and global corporations such as Google, Microsoft, Amazon or Oracle regularly recruit Romanians. Everywhere you look, there's at least one capable Romanian working very far from home.

Back home, Romanian research is not exactly known to be thriving which is not surprising given the minuscule funding allocated by the government. Cross-disciplinarity is almost non-existent; few scientists know what's happening in neighboring areas of expertise - everyone's deeply buried in their own research. Clear information seldom comes to the surface, but when it does, amazing stories are unearthed. One would never have guessed that a Romanian innovated this or researched that – something that speaks volumes to the disinterest of the Romanian public. The Monitoring Policy and Research Activities on Science in Society in Europe (MASIS) study finds a shortage of mass media reporting on science-related news in Romania except when an earthquake or other disaster arises.

So why don't Romania's prodigious students return to their country once their studies at internationally acclaimed universities are complete? If they could be inspired to explore research possibilities in their own country, predictions for Romania's future could brighten. Physicist Andrei Dorobantu is optimistic: "While many may question the infrastructure, the ever-changing, corrupt political system, or the lack of funds and then shrug in dismay, things are starting to change". Laboratories once viewed as ill-equipped are being re-

vamped in regions of educational and research cities such as Cluj, Timișoara, Iași, Brașov or Bucharest and these institutions are trying to attract young researchers to join forces.

A case in point

After having struggled to get funding for more than three years, Romania's Nuclear Physics Institute in the town of Măgurele, neighboring Bucharest, is building the Extreme Light Infrastructure - Nuclear Physics (ELI-NP), an extremely high intensity laser beam which will allow the study of phenomena only anticipated in theory until now, such as the vacuum birefringence and the pair creation intense electric fields.

This will be the world's largest laser and reinforces Romania's history of top research in the field of lasers and nuclear physics.

"ELI-NP will thus impact positively not only fundamental science but also it could result in a change of mentality that will boost the entrepreneurial spirit in researchers," says Professor Nicolae-Victor Zamfir, Director of Horia Hulubei National Institute of Physics and Nuclear Engineering (IFINHH). The social impact of this laser in Romania, he explains, is "of major importance to counteract the country's brain drain, by providing the motivation for top young researchers – who might otherwise seek to go abroad in search of better professional opportunities at large scale research centres – to remain in Romania." There is even talk of building a science village in Măgurele, says Zamfir.

BrainRomania.ro is a national database which facilitates collaboration between Romanian researchers to help them build reputation and accelerate scientific progress. The network service was developed in 2012 after the Romanian Scientific Diaspora conference by Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI) for Romanian researchers and academics located all over the world. One year later, more than 1,000 Romanian researchers have signed on to BrainRomania.ro to make their research more visible.

Local initiatives for education reform

There's big need for change in Romania's kindergarten to grade 12 school system which has been left behind in comparison to other European systems. Growing emphasis on religion has undermined science and evolution studies – something that "speaks to why we are the country that still invests more into building new churches than it does in a better education' says Toma Patrascu, Vice President of the Romanian Secular Humanist Association that promotes ethical humanistic principles, scientific knowledge and the separation of church and state. As science education moves forward in most of the world, Romania remains one of the few places without access to hands-on STEM education.

Romania is still a wild, fertile ground, with regard to science and society initiatives.
The question is how to channel the expertise gained from RestartEdu and PLACES and tailor a science and innovation infrastructure suited to Romania's historical, geographical, political and economic context.

Miruna Amza, a co-author of this article, is Educational Program Manager for a non-governmental organization called Active for the Future (Activi pentru Viitor), based in Bucharest, where she is active within two major initiatives. RestartEdu brings together top education leaders into periodic brainstorms for ideas and exploring ways in which formal and informal education can be boosted, improved and harmoniously combined.

The other initiative is fueled by the European Commission-funded Platform of Local Authorities and Communicators Engaged in Science (PLACES) project along with organizations such as Ecsite, the European Regions Research and Innovation Network (ERRIN) and the European Science Events Association (Eusea). Active for the Future formed the Bucharest City Partnership under PLACES – a project whose premise is to link science communicators with local policymakers for the social and fiscal development of cities across Europe.

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Children engage in tinkering activities,
Ikedoo Institute, Bucharest, Romania

Pop Up Science Event,
Bucharest, September 2013

The current landscape

Spurred on by the PLACES network of science communicators across Europe, Miruna Amza has begun to promote interaction between different science and society actors to support science, technology, engineering, art and math (STEAM) engagement. The hope is to equip Romania with STEAM education (formal and informal) that aligns with constantly changing technology, social innovation and design thinking. Part of the approach involves place-based learning: Using different spaces to engage people with environmental questions, or opening tinkering labs where citizens can experiment and innovate.

The STEAM Initiative is an informal network of science communicators, citizen associations, NGOs, museums and knowledge hubs – a truly eclectic mix of approaches and ideas with the shared objectives of developing local science communication policies, attracting private sector support and promoting each other's presence in the community.

By researching communities that 'speak the same language,' Active for the Future has pinpointed interesting projects across the country which it is now trying to bridge. Take inventory of some major science education and communication initiatives in Romania and one quickly discovers that most have arisen informally:

— Current or former Polytechnic University of Bucharest students have teamed up in projects such as inventeaza.ro, RoseEdu, FaSCInation which teach children to enjoy questioning things, learning technology and programming, constructing robots, or planning trips to outer space.
— Institutes for education such as Ikedoo are alternative learning places for youth to study architecture and science subjects. Young people are becoming interested in and united by the maker culture, without being very much aware of its importance to science centres and modern Western education. Such initiatives are welcomed with a hunger for knowledge and sometimes even sustained by private schools as a small part of their extensive curricula or integrated into cultural centres and festivals.
— Another wave of enthusiasm has greeted The Hub Bucharest, which advances all sorts of interesting collaborations, including guest-hosting Edusfera's Tincuța Apăteanu – a social entrepreneurial outfit responsible for programmes like Digital Kids, Math Club and DNA Day.
— The Center for Complexity studies has one of Romania's oldest programmes in cross-generational public science communication. Projects such as Atlantykron Camp, held in picturesque Capidava County, are reinforced by The Complexity Café which teaches the science of complexity and the integrated concepts within Earth studies.
— Researcher's Night, a project supported by the EU, took place in 11 Romanian cities in September 2013 cities in Romania.
— The first Bucharest Science Festival brings libraries, institutes, organizations and museums into collaboration.
— The Network of European Museum Association's annual conference is slated for early November 2013. Dragos Neamu, President of the Romanian National Network of Museums, says "Museums in Romania are still lacking initiatives and we hope that this event will benefit and inspire a closer collaboration between institutions and the community."
— Grigore Antipa Natural History Museum in Bucharest was renovated in 2011 with support from the Ministry of Culture and EU Structural Funds. The museum welcomed over 60,000 people in its reopening month – equivalent to an entire year's worth of visitors prior to the museum's renewal. Some of the success is being attributed to the museum's new revitalized approach to telling the stories behind concepts and objects.

The way forward

Despite growing momentum to awaken public interest in science, the problem remains that Romania's government is neither creating scientists nor entrepreneurs. Some say that a change in management is required – from an administrative to entrepreneurial model – to get Romania's science and technology engagement on the right track.

It is the duty of all citizens to make sure their nation becomes a better place to learn, a more accessible place to engage with science and a more fertile environment for the next generation of change-makers. And this next generation of thinkers, innovators, researchers – let's call them troubleshooters – arise from many different communities, not just schools and museums.

Romanians must grasp that their social and economic prosperity depends in many ways on connecting to science and technology and using this connection to meet globally significant challenges. Science engagement and innovation are still scarce but developing in this country, and, glancing into the future, one can see that a growing community of science communication practitioners and consumers will only push Romania forward.

Science communication for the 21st century

A CONVERSATION WITH
ANNE GLOVER

Spokes: How can science centres and museums work better with the European Commission to not only disseminate information but also to collect European citizens' views?

Anne Glover: People go into science centres and museums and I think they have great experiences. The challenge is to get all the experience and abilities – particularly science communication – from all the museums and science centres and spread them outside.

So one of the things that could be good – and of course this could be funded by a European Commission programme – is to get those skills in communication and make those a routine part of every undergraduate degree so that when I come from a degree in astrophysics, I am an expert in that field, but I am also an expert in how I can talk about that to a non-expert.

We need a different sort of scientist for the 21st century – it's no good to have the scientist working on their own in the lab and not interacting much with others, apart from other scientists. I'm painting a very bleak picture there, but we need young people who are enthusiastic about science, when they get their degree, being an expert communicator. And that's where I think the museums and science centres have the skills that we – and I include myself in this – don't have.

S: Science centres and museums in evidence-based policymaking: Do science centres have a role in this? If so, what should that role be?

AG: They've definitely got a role in policymaking because they attract citizens – citizens who perhaps have an interest in science and culture and who potentially have an interest in the future and so have a vision for the future. So science centres and museums are very good places for capturing opinions and views. And I think that that those views – and also the challenges that might come from citizens – could be very helpful in, if you like, enabling politicians to see a little further than they currently see.

Let's take an example of the debate around climate change: There's an absolute consensus that we're having a negative impact on our planet, but how do we deal with it? Science can come up with lots of options, but citizens are saying, "Well, I don't like the sound of that because I'm going to have to change or do something different."

So, where we could use the science centres and museums is to ask citizens to imagine what an ideal future would look like and offer them opportunities – would you really like a car of your own or could you share a car and see all the benefits of that or could you use public transport and see benefits with that or could you have much more virtual reality so you wouldn't have to travel anymore.

All these scenarios can be made real by science centres and museums and the information can be then delivered back to the policymakers and the politicians saying that citizens are more open than you think to these possibilities – it's just that we don't often ask citizens.

Spokes caught up with Anne Glover, Chief Scientific Advisor to the European Union, at the 3rd PLACES conference: Modeling cities of scientific culture, in Torino, Italy.

Anne Glover delivers a keynote at the Modeling Cities of Scientific Culture conference, Torino, Italy 20 June 2013

Photo: Silvia Pastore

We need a different sort of scientist for the 21st century – it's no good to have the scientist working on their own in the lab and not interacting much with others, apart from other scientists. I'm painting a very bleak picture there, but we need young people who are enthusiastic about science, when they get their degree, being an expert communicator. And that's where I think the museums and science centres have the skills that we – and I include myself in this – don't have.

www.voicesforinnovation.eu

S: The VOICES project is doing this essentially…

AG: Yes, which I think is very important because all of us must have been in the position where we're listening to the news or we hear a politician telling us that citizens don't like this or don't want that and I'm thinking, "well, I'm one of them and nobody's ever asked me". How do they know I don't want this?

I think [the solution] is all to do with lubricating this flow of knowledge and views and opinions and information from the bulk of the population of citizens into the people who make decisions.

S: What are, in your view, the upcoming aspects in European research that will require a clear dialogue with citizens?

AG: Energy. How we generate energy sustainably, how we use oil and gas, what we should use and what we shouldn't use – biofuels – all of these questions. Citizens have a very important role there.

Climate change, biotechnology – particularly around things like food security. So if we think about genetic modification, we do have to consider how we feed nine billion people by 2050. We do need science and technology to help us there, because we need to do this with less land, less input, less water, potentially quite difficult conditions – all of these things we have to deliver – so we have to think about how we get citizens involved in that dialogue to demand new science or to say they don't want particular science.

Other issues would be – particularly in Europe – that we are an ageing culture and we need to age and live well. Otherwise we can't sustain the population. So we need to think about new technologies for looking at the neurodegenerative disorders and I'm thinking about stem cell technology and so on. But citizens need to be comfortable with the idea of stem cell technology because there's a lot of ethical debate and discussion around that.

Synthetic biology – similarly – being able to generate either new options for storage of energy using microbes or using microbes for fuel.

Views, Opinions and Ideas of Citizens in Europe on Science (VOICES) is a yearlong, Europe-wide citizen consultation, led by Ecsite, exploring the concept of waste as a resource. The project is a means of integrating public opinion into the "Climate action, resource efficiency, raw materials" dimension of Horizon 2020 Work Programmes beginning in 2014.
voicesforinnovation.eu

Nanotechnology is another big area. All of these areas, what's at the back of my mind is, that if we are as bad at communicating those as we were around genetic modification, we've got a real problem on our hands.

We can't deliver a secure future for our population in the 21st century without using the knowledge that we're creating and the technology that we potentially have.

We got it wrong with genetic modification because nobody thought to include citizens in the debate. People thought we'll just create the technology, we deliver it, and that's it. Well, that was the wrong thing to do so we can learn from that and make sure citizens are in right at the beginning and that they're asking the questions and they're making the demands – not politicians or scientists or policymakers.

S: This idea of cities being a good conduit through which citizens can influence policy is a big part of the PLACES project which ends in March 2014 – what can we do with the knowledge community that's been built in that project?

AG: There will be a lot of output from the PLACES project and I think that can be constructed into a meaningful, powerful manifesto for cities that can then be taken to our cities in Europe and they can be challenged and say, "here's what we found – how will you react to this?" When a project comes to an end, it's never really the end, it's the "now what?" It's making sure there's a way that people can benefit from the very interesting and exciting debate.

The PLACES project won't solve every problem we have in the 21st century, but it uses the undoubted power of these hubs of cities – these vibrant organisms that cities are where more and more of us will live because we are becoming more and more urbanized – and use these cities to grow and develop using some of the toolkits that have been developed in PLACES.

We have to give people something very simple and realistic so they can reflect on what they can do. And even a database of experts so that people can think, "this looks interesting but how can I find out about this – who would be the contact in a city that has done this well?"

S: Science communication experts included?

AG: Absolutely, because for me it is all about knowledge brokering: Science communication is using knowledge as an asset and shifting it from one environment to another. And while you do that, of course, you are always adding value to the knowledge.

So if we had to make things easy – clear steps that you can take if you're in a city and you want it to be a city of the future and if you have some resources like databases with good examples of things you can do – and there are contacts – because the most important thing is to be able to pick up the phone and say "I'd like to speak to you about what you've done because I think it could work here."

S: It's that simple, really?

AG: (laughs) It can be that simple.

Cities should have websites and on the website there should be lots of contacts of who does what. I think you must have looked at the websites of some cities – some of them I'm impressed with and some of them I just think….

S: …they're trapped in the 1990s?

AG: Yes, that's how it seems.

But why invent the wheel if someone's already got a good wheel that's working? There's no competition here, actually; a vibrant city somewhere is good for cities everywhere. Just because one city is good doesn't mean another needs to be worse. There's plenty of opportunity for them all to be great and the more collaboration there is, the better.

We used to have these twinnings - lots of places twinned with others. There used to be a lot of cultural interaction which is really helpful and good. We could think about this concept of twinning again, of pairing up cities in exchanging information and driving up the stakes and try to improve to have these real cities of knowledge and science culture.

S: "Scientific Culture Twinning"?

AG: Yes.

The Platform of Local Authorities and Communicators Engaged in Science (PLACES) project, funded by the European Commission and led by Ecsite, fosters connections between scientists, science communicators, citizens, the private sector and policymakers. More than 70 cities in the project are using these connections to develop science communication policies at the local level.
Do not miss: PLACES of scientific culture, Bremen, Germany, 10-12 March 2014.
openplaces.eu/conference

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www.openplaces.eu/conference

ALENA SULDOVA
TECHMANIA SCIENCE CENTRE,
PILSEN, CZECH REPUBLIC

Proving it

A beginner's guide to measuring the impact of our institutions

Science centres and museums are intriguing places that can kick start curiosity about the natural and human-made world for visitors of all ages and backgrounds. Our institutions have nothing short of a profound impact on visitors.

It's safe to say that most professionals in the public engagement with science field hold the above statements to be true, but financial backers are less likely to take these accolades at face value. In essence, they will ask: Does your institution really have an impact and, if so, can you prove it?

How can we measure the impact of a science centre or museum in a practical way? This is the question that has been asked to Marie Hobson, Learning Evaluator at the Natural History Museum in London, UK, and the Chair of Ecsite's REV Group for research and evaluation.

Put yourself in the place of an employee from a small science centre or museum with no evaluation department. Your director says to you, "give me evidence that we have an impact on our visitors." What do you do?

The first thing to do is clarify what they mean by "impact". Do they mean a change in levels of interest, understanding, behaviour etc.?

What is the difference between those things?

Ultimately, institutions want to demonstrate they are having a long-term impact on visitors –by improving students' exam grades, affecting career choices, etc.

However, how realistic is this, given that a one-off museum visit is part of a vast learning landscape? John Falk, a professor and writer specializing in free-choice learning and science education, is currently conducting an International Science Centre Impact Study in collaboration with 16 science centres around the world. In the meantime, the Wellcome Trust, UK, suggests individual institutions focus on more measurable short-term impacts which could be viewed as the stepping stones towards achieving longer-term impacts. For example, if you want to increase the number of students who study science, you need to demonstrate to them that science is fun, relevant and something they can understand – these outcomes are easier to measure than causal relationships between museum visitation and subject choices.

Let's talk about the short-term impact, then. What methods can we use?

The methods you use will depend on what you want to find out, why you want to find it out, for whom you are finding it out, [as well as] time, staffing and budget.

If you are short of time and money, a simple feedback form or online survey will give you some top level results relatively quickly and simply. When visitors are asked to tick boxes and leave a couple of comments, you can easily scan the responses to see if you are getting more "likes" than "dislikes" and you can provide some basic stats, such as "80 per cent of visitors said they enjoyed their visit", which pleases funders and senior management.

However, that data isn't particularly useful. It doesn't tell you *why* 80 per cent enjoyed it or why 20 per cent didn't, therefore, you don't know what was successful and unsuccessful about your offer. Interviewing visitors allows you to explore the reasons behind their opinions and will give you much richer and more useful data. Try out your questions on colleagues first, then visitors, to find any which participants do not understand or find hard to answer. Don't expect to get the perfect set of interview questions the first time.

So what questions should we ask, if we want to be as perfect as possible (even the first time around)?

Again, this will depend on your definition of impact. Does the institution have a mission, set of aims and/or some

Ecsite's Thematic Groups develop organically from within the network fuelled by the energy and professional interests of members.
The REV Group, created in 2011, works to refine the self-reflexivity of the science communication field through research and evaluation.
Don't miss: The REV Group Pre-Conference Workshop preceding the Ecsite Annual Conference, 20-21 May 2014, The Hague, Netherlands.

The International Science Centre Impact Study is an international piece of research involving 16 institutions from 13 countries.
The study is designed to determine if experiences at science centres increases engagement with science in and outside formal education and the workplace, and whether science engagement institutions improve knowledge and understanding of science and support creativity and problem solving.
The research takes an epidemiological approach by looking for correlations between outcomes and a range of science centre experiences of differing types and intensity.
Results of this research will be presented at the Ecsite Annual Conference 2014.

Is he learning?
There are lots of ways to find out.
Photo: Heureka Science Centre,
Vantaa, Finland.

Visitors answer a question
at the Natural History Museum, London, UK.

learning outcomes it wants its visitors to leave with that you need to base your questions around? Though, be careful, if you set out to look for something, chances are you will find it!

To avoid missing unintended or surprising outcomes and to avoid biasing the visitor, start with open ended, broad questions, such as "did you find out anything new or surprising?" before asking more specific questions. If you want to find out something very specific, such as "Having visited the exhibition, can you tell me what scientists do at the Museum?" make sure you ask the visitor to give you an example of how the exhibition showed them [a concept]. That way, you know whether or not they are just agreeing with you to give a perceived "correct" answer.

Are there any questions we should not ask?

There are five types of questions to avoid.

1 **Loaded questions**: Try not to bias your visitor with questions such as "we have just spent 1 million euro redeveloping this gallery with state-of-the-art technology, do you like it?"
2 **Iceberg questions**: Don't overwhelm visitors with huge, difficult questions like "should the government invest more in scientific research?"
3 **Slap-in-the-face questions**: Don't insult your visitor with questions, such as "how old are you?"; "how much do you earn?" etc. If you want to know their age, make a guess or ask them to select an age group. If you are interested in their income, you could ask them what job they do.
4 **Double-barrelled questions**: Don't ask two questions in one, for example, "do you like visiting science centres and art galleries?". Visitors may like seeing one but not the other and won't know how to answer the question (and you won't know how to analyse the answer.)
5 **Hypothetical questions**: Avoid questions relating to future behaviour, such as "do you think you will visit this exhibition again?" Visitors are more likely to say "yes" if they have just had a positive experience, so you have no idea whether they will actually do as they say.

Now that we know what to ask, let's talk about how to encourage visitors to participate in evaluation.

You could take two contrasting approaches to this. One is to integrate the evaluation into the overall visitor experience wherein visitors do not realise they are taking part in an evaluation exercise, they just see it as another museum-based activity.

For example, during an event at the Natural History Museum, London, where children visited different tents to complete activities, I set up an evaluation tent to blend in.

Alternatively, you could emphasize the fact that the visitor is helping the museum improve and that they are in a unique and privileged position to be asked their opinion. During prototype testing of exhibits at the Science Museum, London, conveying the idea that the visitor was getting to go 'behind-the-scenes' and see an exhibit before it was put on display was exciting for participants.

And, of course, offering some sort of incentive, such as a free gift, exhibition tickets, or money, can also help!

If someone is unsure of how to do such an evaluation is there any place to get some insight?

Yes, Ecsite's REV Group was set up to stimulate and help facilitate research and evaluation in science museums and centres across Europe. I suggest they join our LinkedIn group to ask questions and share expertise with other museum evaluators and attend the REV Group's Pre-Conference workshop at the Ecsite Annual Conference 2014 to develop their knowledge and skills further.

04

12

HAPPENINGS

13

EXHIBITIONS

01 It's All About Money! Money is deeply rooted in our lives and sometimes creates challenges. But is it money that is to blame? The exhibition illustrates the relationships between human characteristics, money and social movements, while revealing our decision-making and behavioral characteristics through ten experiments on how we experience money. Now available as a touring exhibition. *tosaki@miraikan.jst.go.jp*

Miraikan, Tokyo, Japan

02 Illuminate the Jewish Hannukah festival at the Bloomfield Science Museum Jerusalem with the Games in Light & Shadow exhibition, MakeLight interactive exhibits collaborating with Israeli Makers, a Light & Fire science show, building a Newton's Color spinning top, bubbles and light performance and guided tours. 27 November – 6 December 2013. *www.mada.org.il*

The Bloomfield Science Museum Jerusalem, Israel.

03 Ingenious! is a Scitech-built exhibition which encourages thinking outside the box as visitors enter a world of tinkering, testing, creating and engineering. Ingenious is a place where toys can either be mended or given a new purpose, vehicles can go on unusual journeys, or structures can be built in the most challenging environmental conditions. *www.scitech.org.au*

Scitech, West Perth, Western Australian

04 Oiseaux (Birds) - The new Exhibition of the Natural History Museum of the City of Geneva opens 21 September 2013 and runs for a year. Learn about birds and how to protect them. *www.ville-ge.ch/mhng/*

Museum Geneve

05 Accelerating Science – the European Organization for Nuclear Research (CERN)'s flagship travelling exhibition about the big bang is available for visitors from 10 October 2013 to 30 March 2014. *www.kopernik.org.pl/en/*

Copernicus Science Centre, Warsaw, Poland

06 Dream to Fly – the first movie created by the Heavens of Copernicus Planetarium – will have its Polish debut in Warsaw in October 2013. Get ready for an amazing adventure in science and the history of flight. *www.kopernik.org.pl/en/*

Copernicus Science Centre, Warsaw, Poland

07 AEGEON - Birth Of An Archipelago - A big exhibition for the most beautiful sea, the creation of its islands and its geological treasures, from the depths of geo historical time to this day, organized by the Natural History Museum of the Lesvos Petrified Forest, designed and produced by Tetragon Ltd. Until January 2014. *info@tetragon.gr*

NOESIS Science Center and Technological Museum in Thessaloniki, Greece

08 Knowledge°room – the workshop for curious people - Empty shops in underserved areas of Vienna become small and temporary science centers for children and adults who like to experiment and to explore. The third room is open October and November 2013. *www.science-center-net.at/wissensraum*

ScienceCenter-Netzwerk, Vienna, Austria

09 Space – comprehensible at last - An Austrian-wide action week on space issues takes place 15-24 November 2013 where ScienceCenter-Network partners invite the public and schools for exhibitions, lectures, workshops and the recently designed discussion game, "Saaatellit". *www.science-center-net.at/weltraum*

ScienceCenter-Netzwerk, Vienna, Austria

10 In the Invention Factory you are the inventor! This interactive exhibition takes the visitor through the different stages of innovation: from getting inspired to designing, building and testing. By participating in hands-on workshops, visitors delve into inventors' tips and tricks. 12 October 2013 – 31 August 2014. *www.continium.nl*

Discovery Center Continium, Kerkrade, Netherlands

11 'For Infinity' Science Exhibition - As part of a year-long programme commemorating the 400th anniversary of the University of Groningen, the Science LinX science center, together with partners from the University, curates a spectacular science exhibition. The exhibits will connect past and present highlights in scientific achievement at the University, and point to the future in line with the anniversary theme, 'For Infinity'. April-June 2014, *Bart van de Laar: b.j.van.de.laar@rug.nl*

Der Aa church, Groningen, Netherlands.

12 Industrial history as melodrama - Paper Devil is the new dramatized exhibition of the Serlachius museum Gustaf in Mänttä, Finland. Based on the biography "The Curse of the green gold" by Teemu Keskisarja, the exhibition describes the obsession of the paper patron G.A. Serlachius (1830-1901) who created an industrial empire around the rapids of remote Mänttä. *www.serlachius.fi/fi/*

Serlachius museum Gustaf in Mänttä, Finland

02 Lights will shine at Bloomfield Science Museum Jerusalem.
05 A graphic rendering of a nuclear detector for the Accelerating Science exhibition, Copernicus Science Centre.
09 Satellites are among the top issues of the Austrian space activities week. Photo: European Space Agency
12 Paper Devil at Serlachius museum. Photo: Mikko Myllykoski
13 Visitors draw conclusions about electrons and positrons at Universum®. Photo: Universum
14 Heavy lifting, Roman style, at Museon.

02

14

COURSES/WORKSHOPS

13 The "Particle Zoo" – On the trail of Higgs, quarks and photons - This new special exhibition will lead the visitors of Universum® Bremen on the trail of the world's smallest building blocks: In cooperation with the DESY research centre, Universum® provides an unusual insight into the mysterious world of particle physics and demonstrates that this area is fascinating not only for Nobel Prize laureates. The special exhibition will be presented from 27 September 2013 to 30 June 2014.
www.universum-bremen.de
www.teilchenzoo.desy.de
Universum® Bremen, Bremen, Germany

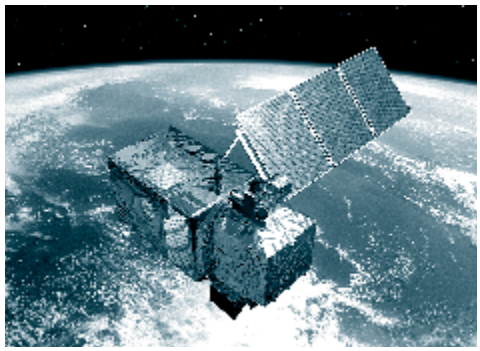
14 High Tech Romans - In the travelling theme exhibition High Tech Romans, visitors of Technopolis®, the Flemish science centre can now discover how inventive the Romans were. A mixture of interactive exhibits and showcases full of archaeological finds are complemented with a show, a demo and educational material to show the innovative character of the Romans.
Contact: Patricia Verheyden
patricia@technopolis.be

05

EXHIBITION DESIGN: This unique program at the Department for Image Science enables students to profit from the knowledge and experiences of outstanding experts in the field of scientific and cultural exhibition-making and design. Beginning 2 November 2013,
contact: *verena.hauer@donau-uni.ac.at*
Danube University, Krems, Austria

SYNERGY WORKSHOP: Transitional Learning Forum for Exchanging Practices and Ideas, 19-21 October 2013. *www.eden-online.org*
Budapest, Hungary

SCIENCE MUSEUM AND SCHOOL: A Cooperation to improve teaching, learning and discovery – European Training Course for Teachers and Museum Explainers, 9th Edition, 1-7 December 2013
museoscienza.org/smec/courses_tenth_eng.htm
Munich, Germany



09

EVENTS

Contemporary Science Film Festival 360°, 10 - 17 October 2013. *http://360.polymus.ru/en/*
Polytechnic museum, Moscow, Russia

Polytechnic Museum Annual Conference: Science in dialogue, 11 - 12 December 2013
Contact: *lobanova@pmfound.org*
Polytechnic museum, Moscow, Russia

PLACES of Scientific Culture, 10-12 March 2014.
www.openplaces.eu/conference
Bremen, Germany

Ecsite Directors Forum 2013: More science, more beauty, more public, 19-21 November 2013 - Register by 22 October. *www.ecsite.eu*
Lisbon, Portugal

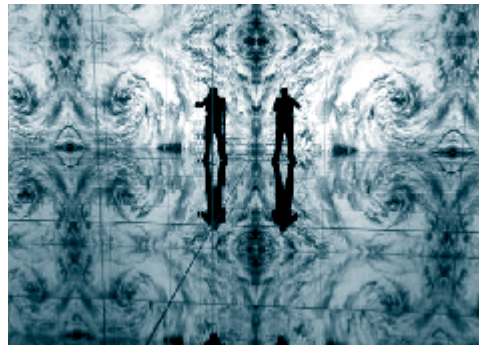
The Fifth International Conference on Science in Society, 22-23 November 2013.
http://science-society.com/the-conference
Copernicus Science Center, Warsaw, Poland

2014 AAAS Annual Meeting, Meeting Global Challenges: Discovery and Innovation, 13-17 February 2014 *www.aaas.org/meetings/*
Chicago, USA

Science Centre World Summit 2014, 17-19 March 2014. *www.scws2014.org/*
Mechelen and Brussels, Belgium

International Public Communication of Science and Technology (PCST) Conference, 5-8 May, 2014. *www.pcst-2014.org*
Salvador, Brazil

25th Ecsite Annual Conference: People, Planet, Peace, 22-24 May 2014.
Call for proposals closes 25 October 2013.
www.ecsite.eu/annual_conference
The Hague, Netherlands



02

LIFE OF ECSITE

Your new Board

They're the science centre and museum professionals who volunteer their time to keep Ecsite on the right path. The current Board, including your new president, was voted in at the Annual General Meeting in June 2013.

Ecsite Board – Executive Committee

President: Rosalia Vargas
President, Ciência Viva – Pavilion of Knowledge in Lisbon, Portugal
Vice-President: Brigitte Coutant
Head of Institutional and International Relations, Universcience – Cité des sciences et de l'industrie, Paris, France
Treasurer: Michiel Buchel
General Director, Science center NEMO, Amsterdam, Netherlands
Past President: Robert Firmhofer
Director, Copernicus Science Centre, Warsaw, Poland

Board members

Jan Alfred Andersson, Manager, Vitensenteret, the Norwegian Museum of Science and Technology, Oslo, Norway
Svein Anders Dahl, Chief Executive Officer, Vilvite, Bergen, Norway
Jean Baptiste Desbois, Executive Director of Cité de l'Espace, Toulouse, France
Louise W. B. Emerson, Head of Business and Commercial Strategy, Natural History Museum, London, UK
Asger Høeg, Director, Experimentarium, Hellerup, Denmark
Helena Lilja, Director of programs and operations, Teknikens Hus, Lulea, Sweden
Pilvi Kolk, Acting director of AHHAA, Tartu, Estonia
Michele Lanzinger, Director, MUSE. Museo delle Scienze, Trento, Italy
Vincenzo Lipardi, Chief Executive Officer, Città della Scienza, Naples, Italy
Ernesto Páramo Sureda, Director, Parque de las Ciencias, Granada, Spain

New Members

New Associate members

Laboratory of Knowledge – Centre for Ideas Development, Belgrade, Serbia: "…develop the skills necessary for the communities of the future."
TOP SECRET e.V., Oberhausen, Germany: "TOP SECRET overcomes clichés and offers visitors a realistic view into the world of espionage. It is Europe´s biggest permanent exhibition about the topic…"
Bursa Science and Technology Centre, Bursa, Turkey: "The center, inaugurated on 21st of October 2012, presents scientific principles in an easy, understandable and entertaining way."
INTECH Science Centre and Planetarium, Winchester, UK: "…encourage young people to consider a career in Science, Technology, Engineering or Maths (STEM)."
Kayseri Science Centre, Kayseri, Turkey: "… multidisciplinary science center which is the second science center of Turkey that includes indoor, permanent and temporary, outdoor permanent exhibition, planetarium, auditorium, library…"

New Sustaining members

Tetragon Ltd., Theassaloniki, Greece: "active in a wide spectrum of design solutions from the architectural work to the designed object, from the urban space to the point of corporate presence of an enterprise, from expressions of culture to the corporate/branding image."

From Associate to Full member

The Polytechnic Museum, Moscow, Russia: "… one of the oldest in Russia museums of science and technology. Its collections include over 190,000 objects documenting the development of science and technology in Russia and worldwide."

Frida & freD – the Graz Children's Museum, Graz, Austria: "…a realizable world for children, meaning that our top priority is for visitors to comprehend by observing and experiencing first-hand."

New Full Member

Universalmuseum Joanneum, Graz, Austria: "More than 4.5 million items in the collections form the basis of a richly faceted 'universal' exhibition and events schedule."

Executive suitcase

Ecsite Executive Director Catherine Franche is all over Europe, meeting, collaborating and facilitating in Ecsite's interests. Here's a peek at her recent and upcoming whereabouts:

September 2013

- Annual Conference Programme Committee meeting, Pilsen, Czech Republic;
- Meeting with Benefits for Members – a sub-group of the Ecsite Fundraising Committee, Hellerup, Denmark;
- Opening of the first Euro-Mediterranean and Middle East Summer School, Granada, Spain.

October 2013

- PLACES Executive Committee meeting, Bremen, Germany;
- Ecsite Fundraising Committee meeting, Brussels, Belgium;
- Ecsite Executive Committee meeting, Brussels, Belgium;
- ASTC Annual Conference, Albuquerque, New Mexico, USA

01

03

01 MUSE's first paying visitor, David Chiappini, with Director Michele Lanzinger. Photo: Mikko Myllykoski
02 The Zero Gravity multi-mirror projection room. Photo: ESA
03 José Manuel Barroso President of the European Commission. Photo: Agata Steifer

THE SCENE

Movements

Béatrice Korc leaves her position as director of science and society, University of Lyon, to become head of scientific culture for the City of Toulouse (Toulouse Metropole) where she will direct the famous La Novela festival and the Quai des Savoirs – a new science centre slated for a 2015 opening.

Gregor Isenbort is the new director at DASA in Dortmund, Germany. He joins DASA via the Museum for Communication Berlin.

Astronaut and engineer **Julie Payette** takes over as Chief Operating Officer of the Montreal Science Centre, Montreal, Canada.

Anneli Pauli moves from the position of Deputy Director-General of Innovation and ERA at the European Commission to take the reigns as director of Heureka Science Centre, Vantaa, Finland.

Eva Jonsson, former Deputy Director at Teknikens Hus in Lulea, Sweden – and a former Ecsite Board member – joins the Norrbotten County Council as a strategist, developing the culture life and the creative industry in the region. The position is linked with strategies for regional growth and Europe 2020.

First in the door

MUSE's first paying visitor (after the museum's 24-hour inauguration weekend) was David Chiappini, 18, from the region of Umbria. Chiappini visited Trento to apply as a student of physics at the University of Trento and was tempted by the city's extravagant new science museum. MUSE's grand opening on 28 July 2013 attracted 30,000 people and the first month attracted 100,000 visitors to the museum. *www.muse.it*

High-level talks at Copernicus

New Narrative for Europe is an ongoing public dialogue project which invites artists, scientists and intellectuals to weigh in on how to reinvigorate the European dream of intercultural peace and exchange for the 21st century. José Manuel Barroso, President of the European Commission, opened a recent New Narrative for Europe meeting at Copernicus Science Centre in Warsaw, Poland, where he was welcomed by the science centre's CEO and Ecsite Past President, Robert Firmhofer. Barroso talked at the event about the future of Europe and how we live in a time of new investments. He noted the role of science and culture in Europe, as well as Europe's pivotal role in the development of science and culture. It is the European citizen's task to inquire, question and search for solutions to new challenges, Barroso said.

This was Barroso's second visit to Copernicus Science Centre - his first occasion was during the Polish Presidency of the EU in July 2011.

An ounce of prevention...

Parque de las Ciencias, in Granada, Spain, nabbed the 2013 DASA Award within the Micheletti competition for its Culture of Prevention Pavilion. Judges stated: "This section of the museum is of great importance to people's daily lives, and is an example which should be followed by science and technical museums everywhere. The prevention of accidents and the injuries which follow is a subject which affects everyone, no matter where they live or work, and what age they may be." The DASA Award is presented to museums that communicate about the working world in an outstanding way.

Science centres part of urban innovation

The European Commission has launched the search for the first European Capital of Innovation, or iCapital. The title and prize of €500000 will go to the city with the best "innovation ecosystem" – one which effectively and efficiently connects citizens, public organizations, academia and business. An info graphic accompanying the award announcement shows science centres, along with universities and research and innovation centres, as part of what connects the public to innovation in a city.

More than 68 per cent of the EU population lives in urban settings and it's these places that will help keep Europe competitive and innovative, according to the European Commisson. "Cities foster innovation in their own provision of services, but the key is to create the right environment for others to innovate and to allow the public and private spheres to connect," says a statement from the Commission. An independent panel will choose the winning city in spring 2014. The deadline for applications is 3 December 2013.
www.europa.eu

New heights of zero gravity

What do the European Space Agency (ESA)'s latest achievements in Earth observation, meteorology, telecommunication, navigation, launchers, human space flight, space laboratories, and exploration of the solar system and deep space mean for science centres and museums? The answer is compelling and realistic new encounters with Space for visitors.

Zero Gravity, Gravedad Cero, the exhibition jointly created with ESA, is now showing at Museo de Las Ciencias Principe Felipe in Valencia, Spain. Not to be missed is the Zero Gravity multi-mirror projection room where visitors feel what it's like to float in Space. The experience includes a mix of sound and outstanding images that take visitors on a Space exploration journey where Earth is viewed from an alternate vantage point. Visitors can expect to be touched by the beauty and fragility of our planet, reinforcing the need to preserve it for future generations.

In November 2013, ESA will further enhance the exhibition with new audio-visual material including spectacular images of the International Space Station and the three launchers - Ariane 5, Soyuz and Vega - from the European Space Port in Kourou.
www.esa.int/exhibiions

Rosalia Vargas,
Photo: Ciência Viva

COMMENT

A welcomed policy paper

Exciting times we're living in! Hardly a day passes by without a new step forward in the understanding of nature and society, an improved possibility for healthcare, a new technological ingredient for prosperity and growth. And yet, feelings of unrest appear to overshadow the public perception of new developments in knowledge and technology. These feelings are certainly not alien to the overall complexity of our time, marked by social inequalities and threats of unsustainable growth, all included in what has been termed the 'risk society'. To the eyes of the public, and rightly so, science and technology are deeply entangled in all these issues, not least because they shape public and private life in so many unprecedented ways. This is probably one of the major challenges facing all those concerned with how knowledge is perceived and appropriated by citizens.

Science for an informed, sustainable and inclusive knowledge society was the title chosen for the most recent policy paper by President Barroso's Science and Technology Advisory Council. It is perhaps one of the most explicit alarm soundings heard in recent times in our field. Anne Glover, President Barroso's Chief Scientific Advisor and all her colleagues at the Council deserve the full attention of our community of museums and science centres for such a manifesto. The recommendation for thematic action on Science and Society in the Horizon 2020 programme is especially noteworthy. The increasing gap between those who produce and apply new knowledge and those who may be affected by its consequences is seen as a major concern. [1]

The challenge for our communities is, therefore, to lead a more equitable and inclusive participation of citizens in science. We have been taking meaningful steps in this direction by consulting, informing and involving the public in matters that should concern all citizens. Projects like PLACES and VOICES, both coordinated by Ecsite, are telling examples of the kind of responsible and socially inclusive science and technology policy that is being proposed by the Council.

I personally salute this daring and thoughtful appeal for informed action in the Science and Society link, and I'm sure I am not alone.

Rosalia Vargas
President of Ecsite,
President of Ciência Viva - Pavilion of Knowledge,
Lisbon, Portugal

1 http://ec.europa.eu/commission_2010-2014/president/advisory-council/documents/stac_policy_paper_no_1_290813.pdf

IN THE NEWS

11 August

The West Australian newspaper interviewed Nobel Prize winner and Scitech patron Professor Barry Marshall who is quoted as saying that interactive science centres are "part of the infrastructure of the modern city."
thewest.com.au

28 August

Ira Flatow of National Public Radio's (NPR) show Science Friday, produced a story called Rebooting Science Museums for the 21st Century. Ian Brunswick, exhibition and events manager at Science Gallery in Dublin, Ireland, was a guest on the segment. Read the transcript or listen to the show online: npr.com

September 23

"Bringing science to life for young people": Journalist Benedict O'Donnell profiles Ecsite's PLACES project in *Horizon: The EU Research and Innovation Magazine*.
http://horizon-magazine.eu

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—

89/7 AVENUE LOUISE
LOUIZALAAN
B-1050 BRUSSELS, BELGIUM
T +32 (0)2 649 73 83
WWW.ECSITE.EU

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TECHNIQUEST
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TEKNIKENS HUS
teknikens-hus.se

Photo: Marcel Loermans.

Science and culture come together at Museon in The Hague, Netherlands.